

# Textile Mill Products

(SIC 22)

## SIGNIFICANT POINTS

- About 3 out of 5 jobs are in three States—North Carolina, South Carolina, and Georgia.
- Production-related workers account for over 4 out of 5 jobs.
- Employment is expected to decline, due to technological advances and an open trading environment.
- Average earnings are low.

### Nature of the Industry

Textile mills make yarn and fabric for clothing and many other items that keep us warm, safe, and in style. Although most people associate textiles with cloth for apparel, the industry also manufactures such products as carpeting, towels, cord and twine, automotive upholstery, reinforcing materials, bullet-proof vests, and decorative braids and ribbons.

A textile mill takes natural and synthetic fibers, such as cotton and polyester, and blends them to create yarn and fabric used in the production of finished products like clothing and upholstered furniture. A few products—sheets, towels, and hosiery, for example—are ready for the retail market when they leave the textile mill. Although a large share of textile products are used in the production of apparel, nontraditional uses, such as in highway construction and fire resistant housing panels, are growing rapidly.

Textile mills are classified by the type of product or process. The major processes of textile production include yarn spinning, weaving, knitting, and tufting. Some textiles are “nonwoven” and are produced by fusing fibers with heat or bonding fibers by using a type of glue. Two or more of these processes often can be found in the same facility. For example, one mill may spin yarn and also weave it into fabric.

*Yarn and thread mills* employ about 15 percent of all workers in the industry. Yarns are strands of fibers in a form ready for weaving, knitting, or otherwise intertwining to form a textile fabric. They form the basis for most textile production and are commonly made of cotton, wool, or synthetic fiber. Yarns also can be made of thin strips of plastic, paper, or metal. To produce spun yarn, natural fibers, such as cotton and wool, must first be processed to remove impurities and give products the desired texture and durability, as well as other characteristics. After this initial cleaning stage, the fibers are spun into yarn.

*Weaving mills* employ about 28 percent of all persons working in the textile industry. Workers in these mills use looms to transform yarns into cloth, a process that has been known for centuries. Looms weave or interlace two yarns, so they cross each other at right angles to form fabric. Although modern looms are complex, automated machinery, the principle remains the same as in ancient times.

*Knitting* is another method of transforming yarn into fabric. Knitting interlocks a series of loops of one or more yarns to form familiar goods, such as sweaters. However, unlike the knitting done with hand-held needles, knitting

in the textile industry is performed on automated machines. Many consumer items, such as socks, panty-hose, and underwear, are produced from knitted fabric. Knitting mills account for 29 percent of employment in the industry.

*Tufting*, used by carpeting and rug mills, is a process by which a cluster of soft yarns is drawn through a backing fabric. These yarns project from the backing’s surface in the form of cut yarns or loops to form the familiar texture of many carpets and rugs. Tufting mills employ about 9 percent of textile workers.

Finally, *nonwoven textile products* are produced by fusing fibers or bonding fibers with a cementing medium or heat. A familiar example of a nonwoven fabric is felt. This segment of the industry is one of the fastest growing, because of its medical and sanitary uses.

Regardless of the process used, mills in the textile industry are rapidly modernizing, as new investments in automation and information technology have been made necessary by growing domestic and international competition. Firms also have responded to competition by developing new products and services. These innovations have had a wide effect across the industry. For example, advanced machinery is boosting productivity levels in textiles, costing some workers their jobs, while fundamentally changing the nature of work for others. New technology also has led to broad and increasingly technical training for workers throughout the industry.

The emphasis in the industry continues to shift from mass production to flexible manufacturing, as textile mills aim to supply customized markets. Firms are concentrating on systems that allow small quantities to be produced with minimum lead time. This flexibility brings consumer goods to retailers significantly faster than before. Information technology allows the retail industry to rapidly assess its needs and communicate them back through the apparel manufacturer to textile firms.

### Working Conditions

Working conditions vary greatly. Production workers, including front-line managers and supervisors, spend most of their shift on or near the production floor. Some factories are noisy and can have airborne fibers and odors; but most textile facilities are relatively clean, well lit, and ventilated.

In 1997, work-related injury and illnesses in the textile mill products industry averaged 6.7 per 100 full-time workers, compared to 10.3 percent for all manufacturing and 7.1 percent

for the entire private sector. This record has been achieved, in part, by requiring, when appropriate, the use of protective face masks, earplugs, and protective clothing. Also, new machinery is designed with additional protection, such as noise shields. Still, many workers in production occupations are required to stand for long periods of time while bending over machinery, and noise and dust still is a problem in some plants.

Most mills operate around the clock, 7 days a week, so some production workers have weekend and evening schedules. Production workers averaged 41.0 hours per week in 1998, compared to an average of 34.6 hours per week for all production workers in the private sector. Overtime is common for these workers during periods of peak production. Managerial, administrative, and administrative support occupations typically work a 5-day, 40-hour week in an office setting, although some of these employees can work significant overtime.

## Employment

Most of the 598,000 wage and salary workers employed in textile mills in 1998 were found in southeastern States. North Carolina accounted for about 30 percent of textile jobs. South Carolina and Georgia combined to provide employment for another 30 percent of the workers in this industry. The remaining jobs were found in the South, California, and the Northeast.

Most textile production is concentrated in large mills. In fact, establishments employing over 250 persons accounted for almost 60 percent of all textile workers in 1997 (chart).

## Occupations in the Industry

The textile industry offers employment opportunities in a wide variety of occupations, but precision production, craft, and repair occupations, coupled with operators, fabricators, and laborers, accounted for over 80 percent of all jobs. Some of these occupations are unique to the industry (see table 1). Additional opportunities exist in general management, engineering, and clerical occupations.

Many workers enter the textile industry as *machine setters and operators*, the largest occupational group in the

industry. They are responsible for setting each machine and monitoring its operation. Usually, operators work with one type of less complex machine, but they can advance to jobs operating more sophisticated machinery or several machines simultaneously. For example, experienced operators may work with machinery that processes raw cotton, spins fibers into thread, or weaves fabric. Additionally, they must diagnose problems when the machinery stops and restart it as soon as possible, to reduce costly machine idle time. Traditionally, operators tended a small number of machines; however, as production processes have become more automated, the number of machines each operator monitors has increased.

Production occupations that require extensive training or apprenticeships include those that install and repair machinery. *Industrial machinery mechanics* comprise about 5 percent of employment in the textile industry. Skilled production occupations also include *inspectors, testers, and graders*, who use precision measuring instruments and complex testing equipment to detect product defects, wear, or deviations from specifications.

*Engineers and engineering technicians*, a vital part of the textile industry, comprise less than 1 percent. Some engineers are *textile engineers*, who specialize in the design of textile machinery, the study of fibers, and textile production. The industry also employs other types of engineers, particularly *industrial and mechanical engineers*.

## Training and Advancement

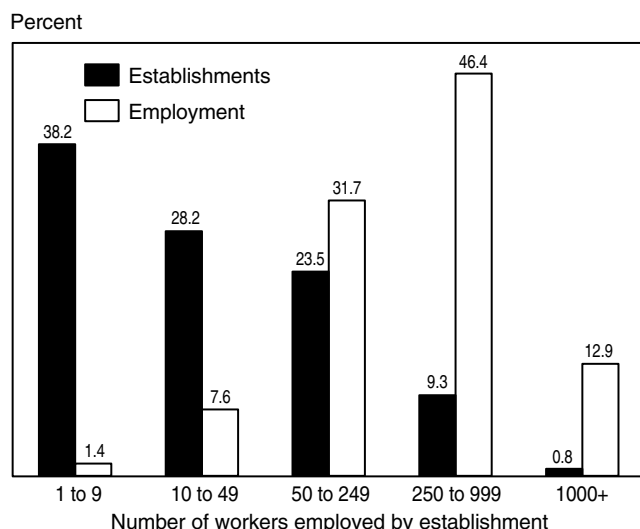
As the textile industry becomes increasingly automated, production workers need to be prepared. A high school diploma may be necessary for many entry-level positions, and extensive postsecondary training is required for more technical jobs. This training may be obtained at technical schools and community colleges. More and more often, job applicants are screened through the use of tests, to ensure that they have the necessary skills.

Extensive on-the-job training has become an integral part of working in today's textile mills. This training may be provided by experienced workers at the firm or by outside contractors and vendors. Technical training is designed to help workers understand complex, automated machinery, recognize problems, and restart machinery, when the problem is solved. Precision production workers, such as industrial machinery mechanics, also require extensive training, often through a combination of classroom and apprenticeship programs. Training may help experienced workers advance to supervisory positions.

Increasingly, training is being offered to enable people to work well in a team-oriented environment. Many firms have established training centers or hosted seminars that encourage employee self-direction and responsibility and the development of interpersonal skills. The emphasis on teamwork, combined with few levels of management in modern textile mills, have placed a premium on workers who show initiative and communicate effectively.

Engineering applicants generally need a bachelor's or advanced degree in a field of engineering or production management. Degrees in mechanical or industrial engineering are common, but concentrations in textile-specific areas of engineering are especially useful. Many applicants, for example, take classes in textile engineering, textile technology, textile

**Nearly 60 percent of jobs in textile mills are in establishments that employ 250 or more workers**



Source: U.S. Department of Commerce, *County Business Patterns*, 1997

materials, and design. These specialized programs usually are found in engineering and design schools in the South and Northeast. As in other industries, a technical degree with an advanced degree in business can lead to opportunities in management.

**Table 1. Employment of wage and salary workers in textile mill products by occupation, 1998 and projected change, 1998-2008**

(Employment in thousands)

Occupation	1998		1998-2008 Percent change
	Number	Percent	
<b>All occupations</b> .....	598	100.0	-16.2
<b>Operators, fabricators, and laborers</b> ...	390	65.2	-19.5
Textile draw-out and winding machine operators and tenders .....	155	26.0	-28.8
Helpers, laborers, and material movers, hand .....	57	9.6	-13.9
Sewing machine operators, garment .....	37	6.1	-30.3
Other machine setters, setup operators, operators, and tenders .....	35	5.8	-8.8
Textile machine setters and setup operators .....	24	3.9	-10.2
Textile bleaching and dyeing machine operators and tenders ...	22	3.6	-8.7
Hand workers, including assemblers and fabricators .....	17	2.8	-11.6
Sewing machine operators, non-garment .....	11	1.8	-6.0
Extruding and forming machine operators and tenders, synthetic or glass fibers .....	10	1.7	5.5
Industrial truck and tractor operators .....	8	1.3	-8.7
Printing, binding, and related workers .....	6	1.0	-15.4
<b>Precision production, craft, and repair</b> .....	110	18.4	-6.7
Industrial machinery mechanics .....	32	5.3	10.8
Blue-collar worker supervisors .....	25	4.2	-9.7
Inspectors, testers, and graders, precision .....	25	4.2	-23.8
Textile, apparel, and furnishings workers, precision .....	11	1.8	2.1
Maintenance repairers, general utility .....	6	1.0	-21.4
<b>Administrative support, including clerical</b> .....	44	7.3	-17.2
Shipping, receiving, and traffic clerks .....	8	1.4	-15.4
Financial records processing occupations .....	6	1.0	-26.0
<b>Executive, administrative, and managerial</b> .....	26	4.4	-12.2
General managers and top executives .....	7	1.2	-13.2
Industrial production managers .....	6	1.0	-11.7
<b>Professional specialty</b> .....	8	1.4	0.6
<b>Marketing and sales</b> .....	7	1.2	-7.8
<b>Service</b> .....	8	1.3	-19.6
<b>All other occupations</b> .....	5	0.8	-15.4

## Earnings

Textile production workers' weekly average earnings were \$426 in 1998, compared to \$563 for production workers in all

manufacturing and \$442 for production workers throughout private industry. Wages within the textile industry depend upon skill level and type of mill. At \$498, weekly earnings in miscellaneous textile goods were the highest in the industry, whereas workers in knitting mills earned an average of \$378 per week, the lowest in the industry. In addition to typical benefits, employees often are eligible for discounts in factory merchandise stores. Earnings in largest occupations in textile mill products appear in table 2.

**Table 2. Median hourly earnings of the largest occupations in textile mill products, 1997**

Occupation	Textile mill products	All industries
First-line supervisors and managers/supervisors-production and operating workers .....	\$14.96	\$16.62
Machinery maintenance mechanics, textile machines .....	11.49	11.49
Textile machine setters and set-up operators .....	10.16	10.13
Textile bleaching and dyeing machine operators and tenders .....	9.14	9.00
Textile machine operators and tenders, winding, twisting, knitting, weaving, and cutting .....	9.08	9.03
Production inspectors, testers, graders, sorters, samplers, and weighers .....	8.92	10.15
Machine feeders and offbearers .....	8.65	8.69
Sewing machine operators, nongarment .....	8.33	7.91
Hand packers and packagers .....	7.68	6.90
Sewing machine operators, garment .....	7.31	6.92

The industry has a low unionization rate; only 5.7 percent of textile workers were union members or were covered by a union contract in 1998, compared with 15.4 percent for the economy as a whole. The most prominent union in the industry is the Union of Needletrades, Industrial and Textile Employees (UNITE), which was formed in 1995 by the merger of the Amalgamated Clothing and Textile Workers Union and the International Ladies' Garment Workers Union.

## Outlook

Jobs in the textile mill products industry are expected to decline by about 16 percent through 2008, whereas employment in the U.S. economy as a whole is projected to grow 15 percent. Employment declines will result from increasing worker productivity, international trade, and the decline of the textile industry's primary buyer—the American apparel industry. Nevertheless, a number of job openings will arise, as experienced workers transfer to other industries, retire, or leave the workforce for other reasons. Most of these openings will become available in production-related occupations, the largest group in the industry.

The most important influence on employment in the industry will continue to be new technologies, such as open-end spinning and new air-jet looms that raise worker productivity. In addition, the application of computers to various processes

in textile production will allow workers to increase productivity and expand the textile industry's competitiveness. These technologies will be implemented at a growing rate in coming years, as textile mills merge to consolidate capital and make their operations as efficient as possible. As this happens, demand for many of the low-skilled machine operators and material handlers will continue to decline.

Jobs also will be affected by the relatively open trading environment, resulting from ratification of the North American Free Trade Agreement and the Agreement on Textiles and Clothing of the World Trade Organization. These agreements will open additional markets to textiles made in the United States, but they will also expose U.S. textile producers to increasing competition from abroad. Some segments of the textile industry, like industrial fabrics, carpets, and specialty yarns, are highly automated, innovative, and competitive on a global scale, so they will be able to expand exports, as a result of more open trade. Other sectors, such as fabric for apparel, will be negatively impacted, as a number of textile and apparel manufacturers relocate production to other countries. On balance, textile mills are likely to lose employment, as a result of this open trade, because of its effect on the American apparel industry. The expected increase in apparel

imports and the decline in apparel production will adversely affect demand for domestically-produced textiles.

### Sources of Additional Information

For additional information concerning career opportunities, technological advances, and legislation in the textile industry, contact:

- American Textile Manufacturers Institute, 1130 Connecticut Ave. NW., Suite 1200, Washington, DC 20036-3954.  
Internet: <http://www.atmi.org>
- Institute of Textile Technology, 2551 Ivy Rd., Charlottesville, NC 22903-4614.  
Internet: <http://www.itt.edu>

Information on the following occupations employed in the textile industry can be found in the 2000-01 *Occupational Outlook Handbook*:

- Apparel workers
- Industrial machinery repairers
- Inspectors, testers, and graders
- Machinists
- Material moving equipment operators
- Textile machinery operators